Claims

I claim:

1. A composition comprising a modified glycoside having the formula:

$$(Y)_n\text{-}X$$

wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the subunits are linked in a linear or branch chain by glycosidic linkages; and

wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one of the saccharide subunits; and

wherein the glycoside has at least one hydroxy group derivatized in the form of an ester, mixed ester, ether or mixed ether; and

wherein the modified glycoside is in the form of a vitreous glass matrix and has a bioactive substance incorporated therein.

2. The composition of claim 1 wherein the saccharide subunits, Y, are the same or different and are selected from the group consisting of glucose, galactose, fructose, ribulose, mannose, ribose, arabinose, xylose, lyxose, allose, altrose, and gulose.

3. The composition of claim 1 wherein the polyalcohol is selected from the group consisting of erythritol, ribitol, xylitol, galactitol, glucitol and mannitol.

4. The composition of claim 1 wherein the modified glycoside is a hydrogenated maltooligosaccharide or isomaltooligosaccharide.

5. The composition of claim 4, wherein the hydrogenated maltooligosaccharide is selected from the group consisting of maltotritol, maltotetraitol, maltopentaitol, maltohexaitol, maltooctaitol, maltononaitol and maltodecaitol.

6. The composition of claim 1 wherein the modified glycoside is selected from the group consisting of hydrophobic esters, mixed esters, ethers or mixed ethers of a glycoside of a sugar alcohol.

7. The composition of claim 1 wherein said modified glycoside is selected from the group consisting of lactitol nonaacetate, palatinit nonaacetate, glycopyranosyl sorbitol nonaacetate, glucopyranosyl mannitol nonaacetate, maltitol nonaacetate and mixtures thereof.

8. The composition according to claim 1, further comprising at least one physilogicaly acceptable glass selected from the group consisting of carboxylate, nitrate, sulfate, bisulfate, a hydrophobic carbohydrate derivative, and combinations thereof.

9. The composition according to claim 1, wherein the composition is in the form of a solid delivery system selected from the group consisting of lozenge, tablet, disc, film suppository, needle, microneedle, microfiber, particle, microparticle, sphere, microsphere, powder, and an implantable device.

10. The composition according to claim 1, wherein the substance is a pharmaceutically active chemical.

11. The composition according to claim 1, wherein the substance is selected from the group consisting of lipids, proteins, peptides, peptide mimetics, hormones, saccharides, nucleic acids, and protein nucleic acid hybrids.

12. The composition according to claim 11, wherein the proteins are selected from the group consisting of enzymes, growth hormones, growth factors, insulin, monclonal antibodies, and cytokines.

13. The composition according to claim 1, wherein the substance is immunogenic and is selected from the group consisting of live viruses, nucleotide vectors encoding antigens, bacteria, antigens, antigens plus adjuvants and haptens coupled to carriers.

14. An optically clear device comprising a modified glycoside having the formula:

$$(Y)_n\text{-}X$$

wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the subunits are linked in a linear or branch chain by glycosidic linkages; and

wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one of the saccharide subunits; and

wherein the glycoside has at least one hydroxy group derivatized in the form of an ester, mixed ester, ether or mixed ether; and

wherein the modified glycoside is in the form of a vitreous glass matrix and has a bioactive substance incorporated therein.

15. The optically clear device of claim 14 further comprising an optically active dye.

16. An optically clear coating on a surface comprising plastic or metal, wherein the coating comprises a modified glycoside having the formula:

$$(Y)_n\text{-}X$$

wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the subunits are linked in a linear or branch chain by glycosidic linkages; and

wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one of the saccharide subunits; and

wherein the glycoside has at least one hydroxy group derivatized in the form of an ester, mixed ester, ether or mixed ether; and

wherein the modified glycoside is in the form of a vitreous glass matrix and has a bioactive substance incorporated therein.

17. The optically clear coating of claim 16 further comprising an optically active dye.

No steps

18. A method of making a vitreous solid delivery system, the method comprising:

a) forming a modified glycoside composition, which is capable of forming a vitreous glass wherein said composition comprises a modified glycoside having the formula:

$$(Y)_n\text{-}X$$

wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the subunits are linked in a linear or branch chain by glycosidic linkages; and

wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one of the saccharide subunits; and

wherein the glycoside has at least one hydroxy group derivatized in the form of an ester, mixed ester, ether or mixed ether; and

wherein the modified glycoside is in the form of a vitreous glass matrix and has a bioactive substance incorporated therein; and ?

b) processing the modified glycosdide and a substance to be released therefrom, thereby to form a vitreous glass maxtrix having the substance incorporated therein.

19. The method according to claim 18 wherein step b) comprises melting the modified glycoside and incorporating the substance in the melt, wherein the melt temperature is sufficient to fluidize the modified glycoside, and insufficient to substantially inactivate the substance, and then quenching the melt.

20. The method according to claim 18 wherein step b) comprises dissolving or suspending the modified glycoside composition and the substance in a solvent effective in

dissolving at least one of the modified glycoside and the substance, and evaporating the solvent.

21. The method according to claim 17 wherein step a) comprises acetylating free hydroxyl groups on a glycoside, thereby to form the modified glycoside.

22. The method according to claim 18 wherein step b) further comprises incorporating into the glass matrix at least one physiologically acceptable glass selected from the group consisting of carboxylate, nitrate, sulfate, bisulfate, a hydrophobic carbohydrate derivative and combinations thereof.

23. The method according to claim 18 wherein step b) further comprises forming the vitreous glass matrix into a form selected from the group consisting of lozenge, tablet, disc, film, suppository, needle, microneedle, microfiber, particle, microparticle, sphere, microsphere, powder, and an implantable device.

24. The method according to claim 18 wherein the substance is a pharmaceutically active chemical.

25. The method according to claim 18 wherein the substance is selected from the group consisting of lipids, proteins, peptides, peptide mimetics, homones, saccharides, nucleic acids, and protein nucleic acid hybrids.

26. A method of forming an optically clear material comprising combining an optically active dye with a modified glycoside composition comprising a modified glycoside having the formula:

$$(Y)_n\text{-}X$$

wherein Y represents a saccharide subunit, n is 1-6, and, when n is greater than 1, the subunits are linked in a linear or branch chain by glycosidic linkages; and

wherein X is a 5 or 6 carbon monosaccharide polyalcohol, and wherein the polyalcohol has a hydroxy group linked via a glycosidic bond to the anomeric carbon of one of the saccharide subunits; and

wherein the glycoside has at least one hydroxy group derivatized in the form of an ester, mixed ester, ether or mixed ether; and

wherein the modified glycoside is in the form of a vitreous glass matrix and has a bioactive substance incorporated therein, and processing the combined dye and modified glycoside to form an optically clear glass having the dye incorporated therein.

27. The method of claim 26 wherein the optically clear glass comprises a filter device.

28. The method of claim 26 wherein the method further comprises forming a coating of the optically clear glass on a surface.

29. The method of claim 28 wherein the surface is plastic or metal